IN THE CLAIMS:

1. (Currently amended) A heat exchanger ~~(50)~~ comprising a stack of parallel ~~perforated~~ plates, wherein ~~(10, 20, 30, 70, 80),~~

each plate ~~(10, 20, 30, 70, 80)~~ of the stack having perforations ~~(15A), characterised in that the perforations (15A) define~~ defining an array of spaced column precursors ~~(16, 21, 31),~~ of thickness equal to the plate thickness,

~~the~~ said column precursors ~~(16, 21, 31)~~ being joined together by ligaments ~~(17, 22A, 22B, 32, 33), each ligament extending between a pair of adjacent column precursors ,the ligaments (17, 22A, 22B, 32, 33)~~ having a thickness less than the plate thickness,

~~the~~ each ligament extending between a pair of adjacent column precursors ~~(16, 21, 31)~~ such that the column precursors of any one plate being coincident in the stack with the column precursors ~~(16, 21, 31)~~ of any adjacent plate, whereby the stack is provided with an array of individual columns, each column extending perpendicularly to the plane of the plates ~~(10, 20, 30, 70, 80)~~,

each plate is provided with extensions in the form of loops which stack together to provide one or more tanks at the sides of the stack, and

whereby fluid flowing through the stack is forced to follow a tortuous flow path ~~to flow~~ around the columns, and has the ability to flow parallel to the plane of each said plate.

2. (Currently amended) A heat exchanger according to claim 1, ~~characterised in that~~ wherein the ligaments ~~(22A, 22B, 32, 33)~~ of each plate ~~(20, 30)~~ of each pair of adjacent plates are displaced relative to those of the other plate of the pair.

3. (Currently amended) A heat exchanger according to claim 1 or 2, ~~characterised in that~~ wherein the top and bottom of the stack are closed by unperforated plates ~~(S)~~.

4. (Currently amended) A heat exchanger according to claim 1 ~~, 2 or 3~~, ~~characterised in that~~ wherein the stack has side plates which are formed by the stacking of unperforated border regions ~~(11, 56, 71, 81, 91, 101)~~ around the edges of individual plates of the stack, the unperforated border regions being integrally formed as part of the plate.

5. (Currently amended) A heat exchanger according to ~~any preceding claim~~ claim 1, ~~characterised in that~~ wherein the perforations ~~(15A)~~ in the plates and the reduced thickness of the ligaments ~~(17A, 22A, 22B, 32, 33)~~ are produced by photochemical etching or spark erosion.

6. (Currently amended) A heat exchanger according to ~~any preceding claim characterised in that~~ claim 1, wherein at least two differently perforated plates ~~(20, 30)~~ are used, the two plates having different ligament patterns.

7. (Currently amended) A heat exchanger according to ~~any preceding claim~~ claim 1, ~~characterised in that~~ wherein the column precursors ~~(16, 21, 31)~~ are of circular cross section.

8. (Currently amended) A heat exchanger according to ~~any preceding claim characterised in that it comprises~~ claim 1, wherein the heat exchanger further comprises a plurality of joined together stacks of the parallel perforated plates, each stack being separated from an adjacent stack by a solid unperforated plate ~~(S)~~ whereby two or more separate fluid stream passageways are provided.

9. (Currently amended) A heat exchanger according to ~~any preceding claim characterised in that~~ claim 1, wherein the perforated plates ~~(10, 20, 30, 70, 80)~~ are of metal of thickness 0.5 mm or less.

10. (Currenty amended) A heat exchanger according to ~~any preceding claim, characterised in that~~ claim 1, wherein the components of the stack are diffusion bonded together.

11. (Currently amended) A heat exchanger according to ~~any preceding claim characterised in that~~ wherein the components of the stack are brazed together.

12. (Currently amended) A heat exchanger according to ~~any preceding claim characterised in that~~ claim 1, wherein the plates ~~(10)~~ of the stack are provided at their edges with extensions ~~(14)~~ to assist location of the plates in the stack.

13. Canceled.

14. (Currently amended) A heat exchanger according to claim ~~13, characterised in that~~ claim 1, wherein the loops ~~(111, 121)~~ are reinforced by cross-members ~~(114, 124)~~.

15. (Currently amended) A heat exchanger according to ~~any preceding claim characterised in that it includes~~ claim 1, wherein the heat exchanger further comprises a plurality of stacks of plates and one pair of adjacent stacks are separated by a plate ~~(1)~~ having perforations ~~(90)~~ to allow controlled injection of fluid at higher pressure from one stack into fluid at lower pressure in an adjacent stack.

16 (Currently amended) A heat exchanger according to ~~any preceding claim characterised in that it additionally has~~ claim 1, wherein the heat exchanger further comprises a plurality of passageways ~~(55, 104)~~ to contain catalytic material, those passageways being separated by an intervening plate ~~(S)~~ from the stack of parallel perforated plates ~~(10, 20, 30, 70, 80)~~.

17. (Currently amended) A heat exchanger according to claim 16, ~~characterised in that~~ wherein the passageways ~~(104)~~ to contain the catalytic material are defined between plates ~~(100)~~ having parallel ribs ~~(103)~~ running the length of the plates.

18. (Currently amended) A heat exchanger according to claim 16 or 17, ~~characterised in that~~ wherein the passageways ~~(104)~~ to contain the catalytic material closed at one or both of their ends by mesh material ~~(55A)~~.

19. (Currently amended) A perforated plate, wherein the plate ~~(10, 20, 30, 70, 80)~~ has an array of spaced column precursors ~~(16, 21, 31)~~, the column precursors being of thickness equal to the plate thickness and being joined together by ligaments ~~(17, 22A, 22B, 32, 33)~~, each ligament extending between a pair of adjacent column precursors ~~(16, 21, 31)~~, the ligaments having a thickness less than the plate thickness , wherein each plate is provided with extensions in the form of loops which stack together to provide one or more tanks at the sides of the stack, and whereby fluid has the ability to flow within the plane of said plate.